

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A method of reducing the amount of peroxides in middle distillate fuels blended with one or more oxygenates, the method comprising the steps of:

providing a middle distillate fuel blended with one or more oxygenates selected from the group consisting of the following: dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate, di-acetates, ethylene glycol acetate, acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate, esters of plant and animal oils, methyl soyate, alcohols, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing;

combining the fuel with a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group, the hydrocarbon additive being described by the formula $R_1R_2CH-CH_2-X$, wherein X is the polar functional group, and R₁ and R₂ are different alkyl groups of carbon chain length from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group;

wherein the amount of hydrocarbon additive combined with the fuel reduces the amount of peroxides in the fuel as compared with the same fuel without the hydrocarbon additive,

wherein the fuel has a sulfur content of about 20 ppm or less, and
wherein the amount of peroxides in the fuel composition is less than about
8 ppm.

2. (Previously Presented) A method as described in claim 1, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids; ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

3. (Cancelled)

4. (Cancelled)

5. (Previously Presented) A method as described in claim 1, wherein the middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel fuel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

6. (Cancelled).

7. (Previously Presented) A method as described in claim 1, wherein the fuel has a sulfur content of about 10 ppm or less.

8. (Previously Presented) A method as described in claim 1, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

9. (Previously Presented) A method as described in claim 1, wherein the hydrocarbon additive is combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel.

10. (Previously Presented) A fuel composition comprising:
a middle distillate fuel;
an oxygenate selected from the group consisting of the following:
dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate, di-acetates, ethylene glycol acetate,

acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate, esters of plant and animal oils, methyl soyate, alcohols, ketones, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing; and

a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group,

wherein the fuel has a sulfur content of about 20 ppm or less, and further wherein the amount of peroxides in the fuel composition is less than about 8 ppm.

11. (Previously Presented) A fuel composition as described in claim 10, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

12. (Cancelled)

13. (Previously Presented) A composition as described in claim 10, wherein the hydrocarbon additive is described by the formula $R_1 R_2 CH-CH_2 - X$, wherein X is the polar functional group, and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group.

14. (Previously Presented) A composition as described in claim 10, wherein the middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel fuel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

15. (Cancelled).

16. (Previously Presented) A composition as described in claim 10, wherein the fuel has a sulfur content of about 10 ppm or less.

17. (Previously Presented) A composition as described in claim 10, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

18. (Previously Presented) A composition as described in claim 10, wherein the amount of hydrocarbon additive is 500 to 2500 parts by volume per million parts of fuel.

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Previously Presented) A method of enhancing the durability of middle distillate fuel system elastomers comprising the steps of:

providing a middle distillate fuel blended with one or more oxygenates selected from the group consisting of the following: dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate; di-acetates, ethylene glycol acetate; acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate; esters of plant and animal oils, methyl soyate, alcohols, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing;

combining the fuel with a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group;

wherein the amount of hydrocarbon additive combined with the fuel enhances the durability of middle distillate fuel systems elastomers as compared

with the durability of elastomers in a middle distillate fuel system combusting a middle distillate fuel without the hydrocarbon additive,

wherein the fuel has a sulfur content of about 20 ppm or less, and further wherein the amount of peroxides in the fuel is reduced to less than about 8 ppm.

24. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

25. (Cancelled)

26. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the hydrocarbon additive is described by the formula $R_1 R_2 CH-CH_2 - X$, wherein X is the polar functional group, and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group.

27. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel fuel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

28. (Cancelled)

29. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the fuel has a sulfur content of about 10 ppm or less.

30. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

31. (Currently Amended) A method as described in claim ~~[[22]]~~ 23, wherein the hydrocarbon additive is combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel.

32. (Previously Presented) A method of enhancing color durability of a middle distillate fuel blended with one or more oxygenates comprising the steps of:

providing a middle distillate fuel blended with one or more oxygenates selected from the group consisting of the following: dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96%

glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate; di-acetates, ethylene glycol acetate; acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate; esters of plant and animal oils, methyl soyate, alcohols, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing;

combining the fuel with a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group;

wherein the amount of hydrocarbon additive combined with the fuel enhances the color durability of the middle distillate fuels as compared with the color durability of a middle distillate fuel blended with one or more oxygenates without the hydrocarbon additive,

wherein the fuel has a sulfur content of about 20 ppm or less, and further wherein the amount of peroxides in the fuel is reduced to less than about 8 ppm.

33. (Previously Presented) A method as described in claim 32, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

34. (Cancelled)

35. (Previously Presented) A method as described in claim 32, wherein the hydrocarbon additive is described by the formula $R_1 R_2 CH-CH_2 - X$, wherein X is the polar functional group, and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group.

36. (Previously Presented) A method as described in claim 32, wherein the middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

37. (Cancelled)

38. (Previously Presented) A method as described in claim 32, wherein the fuel has a sulfur content of about 10 ppm or less.

39. (Previously Presented) A method as described in claim 32, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

40. (Previously Presented) A method as described in claim 32, wherein the hydrocarbon additive is combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel.

41. (Previously Presented) A method of enhancing the fuel stability of a middle distillate fuel blended with one or more oxygenates comprising the steps of:

providing a middle distillate fuel blended with one or more oxygenates selected from the group consisting of the following: dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate; di-acetates, ethylene glycol acetate; acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate; esters of plant and animal oils, methyl soyate, alcohols, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing;

combining the fuel with a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group;

wherein the amount of hydrocarbon additive combined with the fuel enhances the fuel stability of the middle distillate fuel as compared with the fuel

stability of a middle distillate fuel blended with one or more oxygenates without the hydrocarbon additive,

wherein the fuel has a sulfur content of about 20 ppm or less, and further wherein the amount of peroxides in the fuel is reduced to less than about 8 ppm.

42. (Previously Presented) A method as described in claim 41, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

43. (Cancelled)

44. (Previously Presented) A method as described in claim 41, wherein the hydrocarbon additive is described by the formula $R_1 R_2 CH-CH_2 - X$, wherein X is the polar functional group, and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group.

45. (Previously Presented) A method as described in claim 41, wherein the middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel fuel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

46. (Cancelled)

47. (Previously Presented) A method as described in claim 41, wherein the fuel has a sulfur content of about 10 ppm or less.

48. (Previously Presented) A method as described in claim 41, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

49. (Previously Presented) A method as described in claim 41, wherein the hydrocarbon additive is combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel.

50. (Previously Presented) A method of reducing fuel sediment in a middle distillate fuel blended with one or more oxygenates comprising the steps of:

providing a middle distillate fuel blended with one or more oxygenates selected from the group consisting of the following: dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96%

glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, dimethyl carbonate and diethyl carbonate; di-acetates, ethylene glycol acetate; acetals, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate; esters of plant and animal oils, methyl soyate, alcohols, aldehydes, carboxylic acids and esters thereof, and mixtures of one or more of the foregoing;

combining the fuel with a hydrocarbon additive, the hydrocarbon additive comprising a polar functional group and a tertiary hydrogen beta to the functional group;

wherein the amount of hydrocarbon additive combined with the fuel reduces fuel sediment in the middle distillate fuel as compared with the fuel sediment in the middle distillate fuel blended with one or more oxygenates without the hydrocarbon additive,

wherein the fuel has a sulfur content of about 20 ppm or less, and further wherein the amount of peroxides in the fuel is reduced to less than about 8 ppm.

51. (Previously Presented) A method as described in claim 50, wherein the polar functional group of the hydrocarbon is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing.

52. (Cancelled)

53. (Previously Presented) A method as described in claim 50, wherein the hydrocarbon additive is described by the formula $R_1 R_2 CH-CH_2 - X$, wherein X is the polar functional group, and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group.

54. (Previously Presented) A method as described in claim 50, wherein middle distillate fuel is selected from the group consisting of diesel fuel, biodiesel fuel, burner fuel, kerosene, gas oil, jet fuel, and gas turbine engine fuel.

55. (Cancelled).

56. (Previously Presented) A method as described in claim 50, wherein the fuel has a sulfur content of about 10 ppm or less.

57. (Previously Presented) A method as described in claim 50, wherein the fuel further comprises one or more components selected from the group consisting of: corrosion inhibitors, antioxidants, anti-rust agents, detergents and dispersants, fuel lubricity additives, demulsifiers, dyes, inert diluents, cold flow improvers, conductivity agents, metal deactivators, stabilizers, antifoam additives, de-icers, biocides, odorants, drag reducers, combustion improvers, MMT, oxygenates and like materials.

58. (Previously Presented) A method as described in claim 50, wherein the hydrocarbon additive is combined with the fuel at a treat rate of 500 to 2500 parts by volume per million parts of fuel.

59. (Cancelled)

60. (Previously Presented) A fuel composition, comprising:
a middle distillate fuel;
an oxygenate selected from the group consisting of the following:
dimethyl ether (DME), butyl ether, amyl ether, di-n-butyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, carbonates, di-acetates, ethylene glycol acetate, acetals, 2-ethylhexylacetate, methanol, isopropanol, butanol, ketones, and mixtures of one or more of the foregoing; and
a hydrocarbon additive described by the formula $R_1 R_2 CH-CH_2 - X$,
wherein X is a polar functional group selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, nitrate esters, phenols, and mixtures of one or more of the foregoing; and R_1 and R_2 are different alkyl groups of carbon chain length of from two to about thirty carbon atoms appended to the carbon molecule beta to the polar functional group, and

wherein the fuel has a sulfur content of about 20 ppm or less, the amount of hydrocarbon additive is 500 to 2500 parts by volume per million parts of fuel, and wherein the amount of peroxides in the fuel composition is less than about 8 ppm.

61. (Previously Presented) The fuel composition as described in claim 60, wherein the oxygenate is selected from the group consisting of butyl ether, amyl ether, glyme polyethers, diethylene glycol methyl ether (DGME), triethylene glycol dimethyl ether (triglyme), diethylene glycol dimethyl ether (diglyme), butyl ether 1,2-dimethoxyethane (glyme), Cetaner (a blend of 96% glyme and 4% dimethoxymethane), ethylene glycol mono-tert-butyl ether, ethylene glycol mono-n-butyl ether, methanol, isopropanol, and butanol.

62. (Previously Presented) The fuel composition as described in claim 60, wherein the oxygenate is selected from the group consisting of carbonates, di-acetates, acetals, 2-ethylhexylacetate, ketones, and mixtures of one or more of the foregoing.

63. (Previously Presented) The fuel composition as described in claim 60, wherein the oxygenate is selected from the group consisting of dimethyl carbonate, diethyl carbonate, ethylene glycol acetate, dimethoxymethane (DMM or methyl-al), 2-ethylhexylacetate, and mixtures of one or more of the foregoing.

64. (Previously Presented) The fuel composition as described in claim 60, wherein X is selected from the group consisting of the characteristic moieties of the following: alcohols, alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, phenols, and mixtures of one or more of the foregoing.

65. (Previously Presented) The fuel composition as described in claim 60, wherein X is selected from the group consisting of the characteristic moieties of the following: alkyl esters, carboxylic acids, ketones, aldehydes, amines, amine esters, nitro-, and nitrite-compounds, phenols, and mixtures of one or more of the foregoing.